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A Comprehensive Assessment of Customer Engagement in Digital Banking Services in Afghan Banks

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ABSTRACT

While digital transformation has revolutionized banking globally, the journey of digital banking in Afghanistan has faced some challenges, including limited digital infrastructure, low digital literacy, and security concerns. This mixed-methods study proposes to discuss the level of customer engagement with digital banking services in ten banking organizations of Afghanistan. 401 customers were surveyed and branch managers and IT heads were interviewed to gather quantitative and qualitative data, respectively. The internal consistency of the digital banking scale was good, with Cronbach's α of 0.95. A one factor exploratory factor analysis was obtained, accounting for 66.0% of the variance in attitudes towards digital banking. The descriptive results showed that 75.8% of the respondents were male, 71% of them were between the age of 26 to 40 years, and 53.4% of them lived in urban areas. Online and mobile banking services were the most common digital banking services utilized. The analysis revealed that male respondents, urban residents and those with higher education levels were more likely to use digital banking services than their female counterparts, rural residents and lower education counterparts respectively. Regression analysis also showed that education level and living in urban areas were significant factors in predicting digital banking engagement. Qualitative results corroborated these findings, with ease of use, trust and infrastructure availability being identified as key factors, and a lack of advanced services and digital literacy being identified as challenges. The study calls for enhancement of digital banking services in rural areas, setting the minimum standards for digital banking services, improving cybersecurity, and enriching digital literacy initiatives. The overall findings offer implications for the Afghan banking sector and policymakers aiming to improve digital banking engagement and foster financial inclusion.

Keywords: *The Topics of Digital Banking; Customer Engagement; Financial Inclusion; Digital Literacy and Digital Infrastructure of Afghan Banks Were Discussed*

1. INTRODUCTION

Digital technologies are reshaping the financial services industry, paving the way for mobile apps, online banking, and AI-powered solutions that streamline operations and boost customer satisfaction. In today's digital banking world, customer engagement is a key factor in customer satisfaction and loyalty, as it's driven by the constant digital interaction between customers and banks. (Brodie et al., 2011; Verhoef et al., 2010).

Digital banking is an established part of financial systems in developed economies, where good infrastructure and digital literacy are key, but has lagged in fragile and low-resource countries like Afghanistan (Organization for Economic Cooperation and Development (OECD, 2020). Infrastructural, socio-economic and institutional constraints are significant challenges to the adoption of digital banking in Afghanistan, such as weak internet coverage, low digital literacy, and lack of trust in financial institutions, cyber security concerns and persistent socio-political instability (Ministry of Finance, Afghanistan, 2023; Rahman, 2021; World Bank, 2022). Overall, the penetration rate in Afghanistan is not high and varies across demographic and geographic segments, with empirical evidence showing that technological readiness, regulatory frameworks, and customer perceptions are significant factors that shape digital banking adoption (Hakimi et al., 2023; United Nations Development Programmed & United Nations Capital Development Fund, 2023). Although many banks in Afghanistan have introduced mobile banking, SMS banking and Internet portals, many of their customers do not know about these services and avoid use of them because of security concerns and usability issues. Additionally, there is little systematic empirical research that explores customer perceptions, behaviors and engagement in Afghanistan, meaning financial institutions and policy makers are lacking important evidence-based guidance to create successful digital strategies. This study aims to fill that void by measuring digital banking engagement using digital channels, the factors impacting on digital banking engagement (including digital literacy, level of trust, security perceptions, usability, and socio-economic factors), assessing customer satisfaction and perceived value, examining infrastructural and cultural barriers to digital banking uptake, comparing engagement across urban and rural areas and public and private banking institutions, and proposing evidence based recommendations for improving digital banking usage and financial inclusion in Afghanistan. This research extends theories of technology acceptance and customer engagement to the context of low resource and high risk, and brings academic insights and practical relevance for banks, regulators, and development partners working to improve digital financial ecosystems and inclusive economic development in Afghanistan.

2. LITERATURE REVIEW

Digital banking has appeared for many banks to enhance service accessibility, speed up processing speeds and offer more convenient customer experiences, including via mobile app, internet banking and self-service technology. Customer engagement is a key factor in this environment, not only because it indicates whether the customer takes up the digital service, but also how active and frequent they are with it. The latest literature demonstrates that engagement is a multi-faceted phenomenon, which involves four main components: behavioral (frequency of use, variety of channels), cognitive (attention, perceived value, perceived usefulness), emotional (attachment, trust, satisfaction). From a banking perspective, this is significant because engagement also can be used to help predict behaviors that are not necessarily measured by just using a product. Engagement also increases when customers have meaningful interactions with digital channels, and are comfortable with the relationship with the bank, according to studies (Levy, 2022; Kowsar et al., 2025; Mackay et al., 2025).

The majority of digital banking adoption studies are based on the Technology Acceptance Model, which suggests that perceived usefulness and perceived ease of use are key factors in technology adoption (Davis, 1989).

In the banking sector, the two perceptions affect the attitudes towards digital channels and customers' intentions to use digital channels. Later research, however, highlights that other factors, including trust, perceived risk, self-efficacy and social influence, are also critical to adoption and participation in DFInS, particularly when the service entails sensitive personal and financial information (Alalwan et al., 2016).

The Afghan case bears this out. Users are more likely to use internet banking if they believe it is helpful and simple, but this decreases when users are uncertain about its security, their ability to use it, and its reliability (Wasiq et al., 2022; Ansari & Rasool, 2019).
Hence, in fragile contexts, a combination of TAM variables and contextual constraints is required to understand engagement levels.

Digital engagement is also closely linked to service quality and satisfaction as the more reliable, faster and responsive the digital system is, the more likely those users are to continue to use digital channels. A study conducted in emerging markets reveals that dimensions of the e-banking service quality (security/privacy, convenience, speed, and reliability) play a significant role in e-banking service satisfaction, which in turn is important for keeping consumers loyal and engaged in the service. This is so especially when things are not going well, as customers are more likely to turn to digital channels but also more sensitive to disruption, delays, or risk signals (Harb et al., 2022). The findings further indicate that customer expectations and perceived risks are closely related to digital service experience, which further highlights that the satisfaction outcomes of a well-designed service can be undermined if customers have expectations of problems or fear losses (Ayinaddis et al., 2023; Rakocevic et al., 2025). These results indicate both system performance and customers' perceptions of stability and value are important factors in engagement.

Engagement goes beyond service quality, with digital banking platforms creating a positive user experience and effective relationship-building processes. Research into digital only banking also indicates that younger consumers – both Gen Y and Gen Z – can appreciate a smooth interface, easy navigation and a uniform digital experience on all devices, which leads to increased engagement with digital platforms (Windasari et al., 2022).

Other research indicates that interactive communication, personalization, and clear information delivery are strategies that enhance perceived relevance and diminish uncertainty regarding online transactions, which can thus support engagement (Agarwal et al., 2024).

Communication strategies are also a part of it, such as the e-marketing strategies and their influence on the perception of the customer and the further interaction with banking services (Ghonim & Awad, 2025). Importantly, in emerging economies in-branch support could still be an element of the mix for encouraging customers to experiment and continue to use digital channels (Kaur et al., 2021).

One of the most consistent drivers of digital banking use and engagement is trust – customers need to feel confident that digital transactions are secure and their data will not be misused. The systematic review shows that cyber threats and risk perceptions have a direct impact on decreasing digital banking adoption, especially when customers rate high levels of uncertainty in relation to fraud, privacy and systems reliability (Cele & Kwenda, 2024).

Evidence related to this indicates that a user's perception of cybersecurity and financial literacy can affect their satisfaction with online banking, meaning that users who are not skilled may have a more negative view of the services, and may even be unwilling to use online banking services that are available (Hasan et al., 2025). Other studies also indicate that perceived risk, trust, and perceived security are still important in the commercial banking environment in predicting adoption (Kadri, 2025).

Lack of trust and security concerns can often be seen as a recurring hurdle in Afghanistan, particularly among mobile banking customers, who are largely skeptical of the security and convenience of mobile banking (Naseri et al., 2025).

However, in low-resource environments, engagement is influenced not just by attitudes, but by structural factors like availability of the internet, access to devices, device access costs, and electricity reliability. With weak infrastructure, customers might have to face service outages and even transaction failures, which diminishes trust and prevents their return. Digital literacy is also important as customers need some basic skills to register, use apps, know what to do for security, and how to handle mistakes. A more comprehensive exploration of digital inclusion reveals that access is not enough; skills in digital literacy, knowledge, and confidence in using digital tools are crucial to long-term engagement with digital finance (Aziz & Naima, 2021).

The digital divide in Afghanistan is evident in large part because of significant challenges faced by organizations in digital transformation and the adoption of technology, especially in smaller organizations and away from major cities (Hashimi & Azeem, 2025; Hakimi et al., 2025).

This is also mentioned in broader developing economy literature on digital transformation (Ononiwu et al., 2024).

Despite the various benefits digital banking offers customers, adoption and engagement is uneven, as indicated by several studies conducted in Afghanistan. Although several studies indicated that using digital banking can enhance customer satisfaction and service experience by making things more convenient and easier for the customers, there is still a fair amount of studies in Afghanistan that showed that there are uneven adoption and engagement at the customer level. Internet and mobile banking have a positive impact on customer satisfaction in Afghanistan, while ATM continues to be a key channel for customer engagement, as evidenced by commercial banks (Saleh et al., 2025; Arshad et al., 2024; Karimi, 2016).

Meanwhile, research focusses on the obstacles including low awareness, low digital literacy, high security concerns, and weak infrastructure which hinders customers' willingness to adopt or regularly use internet and mobile banking (Wasiq et al., 2022; Naseri et al., 2025).

Other studies also indicate that trust, perceived benefits and regulatory and institutional preparedness are crucial for the overall e-banking transformation in Afghanistan (Hakimi et al., 2024). Additionally, the findings indicate that a poor reputation and communication can also negatively impact long-term relationships with banks (Arshad et al., 2025).

The literature in Afghanistan has some valuable contribution, but the literature mostly concerns the intention to adopt and customer satisfaction, while a smaller number of studies emphasize customer engagement as a multidimensional concept which involves cognitive, emotional and behavioral aspects of customers. Much of the existing Afghan work also focuses on a single channel (mobile banking, internet banking or ATM) instead of getting a view of multi-channel engagement in an integrated model (Saleh et al., 2025; Wasiq et al., 2022; Arshad et al., 2024).

In addition, there is limited empirical evidence on how structural factors (infrastructure, digital literacy) and socio-demographic factors (education level, urban–rural residence) jointly shape engagement outcomes in Afghanistan. This study addresses these gaps by assessing customer engagement across Afghan banks through a mixed-methods approach and by linking engagement to key contextual determinants such as ease of use, trust, infrastructure constraints, and capability differences, providing evidence based implications for strengthening digital banking and financial inclusion.

3. THEORETICAL FRAMEWORK

The study draws on the Technology Acceptance Model (TAM) and its extensions (e.g. UTAUT), which posit that perceived ease of use and perceived usefulness shape behavioral intentions toward technology. In the Afghan context, we extend these models by incorporating digital literacy, trust in security, perceived convenience, service diversity/infrastructure and digital skills as antecedents of customer engagement. Demographic characteristics gender, age, education and residence are treated as moderating factors. The conceptual model shown in Figure 1 depicts constructs that served as the basis of the study as well as the proposed relationships among these constructs. It explains what is believed to happen during the interaction of these variables and serves as a guide for the research and the hypothesized relationships.

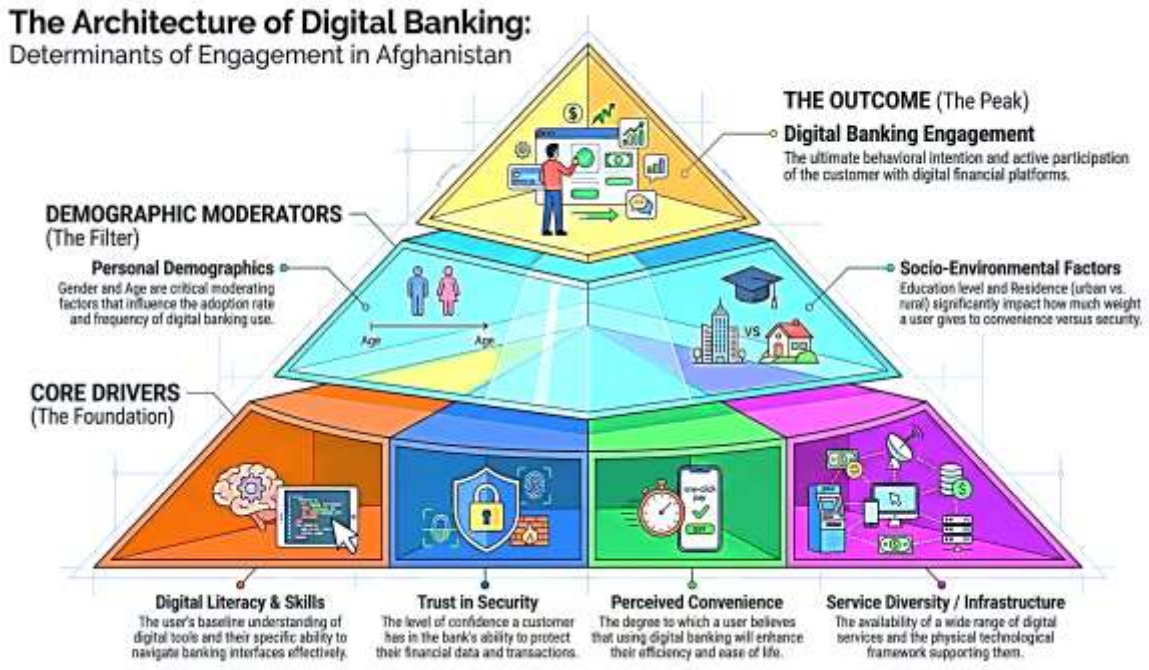

Figure 1: Conceptual model

The factors that influence Digital Banking Engagement, as the major outcome variable, are explained with the proposed research model. The model is composed of four independent variables (IVs) which include Digital Literacy & Skills, Trust in Security, Perceived Convenience, and Service Diversity/Infrastructure. It is believed these will impact users' eagerness to use and their involvement with digital banking services. Digital Banking Engagement is the dependent variable (DV), which indicates customers' behavioral intention and real engagement in digital banking platforms. Moderating variables have been included in the model as well, which includes, for example, Demographic Moderators (age and gender) and Socio-Environmental Factors (education level and rural/urban context). These could either amplify or diminish the impact of these core factors on Dbe.

4. METHODOLOGY

4.1 Study Design

The data collection was a mixed methods approach: quantitative (survey) and qualitative (interviews). The quantitative part recorded the demographic characteristics and perceptions and levels of engagement by means of structured questionnaires. The qualitative part used semi-structured interviews to get deep and detailed insights from bank managers and IT heads regarding service delivery, challenges, and strategies.

4.2 Sampling and Data Collection

The population under study consisted of customers, and branch and IT managers of ten major commercial banks in Afghanistan (Afghan Millie Bank, Pashtany Bank, New Kabul Bank, Afghanistan International Bank, First Microfinance Bank, Azizi Bank, Afghan United Bank, Miawand Bank, Ghazanfar Bank and Islamic Bank of Afghanistan). To achieve representativeness across governmental and private sectors and across levels of maturity in digital services, purposive sampling was employed. A quantitative survey was carried out in selected branches in urban and rural areas using face to face questionnaire method. There were 401 completed responses. The branch managers and IT heads were interviewed face-to-face or through a secure online call; interviews were audio recorded and transcribed with permission.

4.3 Research Instruments

A survey questionnaire was designed with three sections:

- Demographic factors: gender, age, place of residence (urban or rural) and education.
- Digital banking perceptions: nine items measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) that assessed comfort, convenience, trust, speed, cost reduction, internet access, digital skills, future usage intentions and likelihood to recommend digital banking.
- Customer engagement: Nine items measuring behavioral, emotional and cognitive engagement with digital services (e.g. frequency of use, satisfaction, loyalty, advocacy) on the same Likert scale.

Interview guides: Two semi-structured guides were created:

- Manager guide: delivery of digital services, most-used features, perceived engagement, drivers and barriers, initiatives for improvement, technology adoption needs and trust-building strategies.
- IT guide: system robustness, areas for improvement, cyber security measures and privacy protection.

4.4 Prepare and analyze data

All the survey data were processed (coded, organized and cleaned) in the Statistical Package R before analysis. Data screening techniques were used for identification of incomplete, inconsistently coded and possible input errors. Due to the less than 2% missing values, list wise deletion was used to eliminate any incomplete responses in order to ensure reliability and validity of the analysis. A 5-point Likert Scale for all questionnaire items was used from “Strongly Disagree” (1) to “Strongly Agree” (5). Items were not reverse coded because no questions were asked in the negative. The general measurement scale reliability test was conducted using Cronbach's alpha coefficient method, with the digital banking perception items and digital banking engagement items. The overall Cronbach's alpha score value of 0.95 showed a high level of internal consistency among items in the survey, meaning it was a very reliable measure of customer engagement with their digital banking service. Moreover, scale-total correlation scores were also analyzed to gauge the effect each item has on the total scale reliability. For determining the suitability of the data set which can be used for factor analysis in the present study, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were used. All values were within the satisfactory criteria by KMO value, that is, excellent sampling adequacy and Bartlett's test was statistically significant, supporting the use of a correlation matrix for factor extraction. To extract dimensions of customer engagement and perceptions of digital banking, an Exploratory Factor Analysis (EFA) was then performed with rejections based on both Kaiser–Kaiser criterion and a scree plot. Analysis identified one over-arching factor to account for around 66% of the variance, indicating that the measured variables are highly related in terms of a single digital banking engagement construct. The summary of the respondent characteristics and perceptions about the digital banking services were

conducted using descriptive statistical techniques such as means, standard deviations, frequencies and percentages. Additionally, demographic group difference inferential statistical analysis was done. Independent sample t tests were conducted to test for differences in level of engagement across binary variables like gender and residence, and one-way Analysis of Variance (ANOVA) was used to evaluate the differences across the age and education groups. In addition, a multiple linear regression analysis was conducted to examine demographic and socioeconomic factors influenced the customer's feedback on digital banking services. The regression model has been adjusted to account for digital banking engagement through gender, age, education and urban–rural to show their predictive value. The qualitative part of the study involved transcribing and analyzing interview data from branch managers and IT heads, which was done using the methods of thematic analysis. The qualitative findings were subsequently analyzed and triangulated with the quantitative survey results to increase the credibility, consistency, and interpretation of the study. The use of mixed-methods approach and analytical methods enabled the bankers to have a comprehensive vision about customer engagements, adoption trends in digital banking and challenges facing the banks in Afghanistan.

4.5 Ethics

Participation was voluntary. Informed consent was verbal and written and included the fact that participation was anonymous and that withdrawal was possible at any time. Personally identifying information was not collected. Approval on ethical clearance and operational permissions was obtained from the Operations Department and Digital Banking Department of the banks in Afghanistan and from the Bank Branch Managers. International research ethics guidelines were followed in all procedures.

5. RESULT

5.1 Bank Characteristics

Bank	Establishment Year	Experience (yrs)	Sector	Cities Branches	Provincial Branches	District Branches	Total Branches
Afghan Milli E Bank	1933	93	Government	18	21	2	39
Pashtany Bank	1954	72	Government	17	8	1	26
New Kabul Bank	2004/ 2011	22	Government	20	37	10	67
Afghanistan International Bank	2004	22	Private	16	6	0	22
First Microfinance Bank	2004	22	Private	7	14	16	37
Azizi Bank	2006	20	Private	25	32	3	60
Afghan United Bank	2007	19	Private	13	21	1	35
Miawand Bank	2009	17	Private	09	15	3	27
Ghazanfar Bank	2009	17	Private	07	08	02	17
Islamic Bank of Afghanistan	2009/ 2018	17	Private	30	18	0	48

Source: Compiled based on official information and operational data obtained from Afghan banks (2025).

The table 1 provides details on the top 10 banks in Afghanistan regarding the year of establishment, years of experience, sector classification, and locations of their branches in cities, provinces and districts as follows: The data show that there are substantial differences in the backgrounds, institutional experience and geographic scope of banks. The oldest bank among the listed banks is Afghan Milli Bank which was established in 1933 and has banking experience of 92 years. It is followed by Pashtany Bank established in 1954 having 71 years of experience. Both are state-run and are regarded as a part of the banking foundation of Afghanistan. Unlike private banks, most of them were founded after 2004, and this is because of the modernization and development of the Afghan banking sector during the economic reforms after 2001. New Kabul Bank has the highest number of branches (67) consisting of 20 city branches, 37 provincial branches and 10 district branches in terms of the number of branches. Likewise, Azizi Bank has 60 branches and Islamic Bank of Afghanistan has 48 branches across the country. Ghazanfar Bank, on the other hand, has the least number of branches, having just 17 across the country. Further, the table indicates that the availability of banking services in the districts is still limited with majority of the banks being located in the urban and provincial centers. But First Microfinance Bank is relatively strong with 16 district branches, which is supposed to signify a relatively stronger presence in underserved and rural areas. Overall, the above table shows that the banking system in Afghanistan is still mostly concentrated in urban areas, but a few banks have reached provincial and district levels. The geographical expansion can help to increase financial inclusion and enhance the penetration of digital banking services throughout the country.

5.2 Infrastructure and Service Availability

Bank	ATMs	Internet Banking	Mobile Banking	POS Services	Wallet	MasterCard /Prepaid	Agency Banking
Afghan Milli E Bank	23	Yes	Yes	Yes	Yes	No	No
Pashtany Bank	10	Yes	Yes	No	yes	No	No
New Kabul Bank	21	Yes	Yes	Yes	No	Yes	No
Afghanistan international Bank	57	Yes	Yes	Yes	Yes	Yes	No
First Microfinance Bank	8	Yes	Yes	No	Yes	Yes	No
Azizi Bank	104	Yes	Yes	Yes	Yes	Yes	Yes
Afghan United Bank	47	Yes	Yes	No	Yes	Yes	No
Miawand Bank	5	Yes	Yes	No	No	No	No
Ghazanfar Bank	20	Yes	Yes	No	Yes	Yes	No
Islamic Bank of Afghanistan	45	Yes	Yes	Yes	Yes	No	Yes

Source: Compiled from official websites and digital banking service information of selected Afghan banks (2025).

Table 2 shows the accessibility of digital banking products and services in selected Afghan banks such as ATM, Internet banking, mobile banking, point of sale and digital wallet, MasterCard/prepaid cards and agency banking. The results have shown that almost 100 percent of banks offer Internet banking services and mobile banking services, which is a good sign of how digital financial technologies are being embraced in the Afghan banking sector. The total number of ATMs in the surveyed banks is also different: In Azizi Bank, ATMs are 104, Afghanistan International Bank has 57 ATMs and Afghan United Bank has 47 ATMs. This indicates that these banks have invested more in digital infrastructure and accessibility to customers. On the other hand, there are relatively small ATM networks in operation for two other banks, namely Miawand Bank and First Microfinance Bank. Then there are two banks,

namely Miawand Bank and First Microfinance Bank with relatively small ATM networks. The table also reflects differences in availability of higher-level digital services. The POS services are limited to only a few banks in Afghanistan such as Afghan Milli Bank, New Kabul Bank, Afghanistan International Bank, Azizi Bank, and Islamic Bank of Afghanistan. Likewise, certain MasterCard and prepaid card services are not available in all countries, reflecting a lack of international and card-based banking services. Agency banking services are even more restricted, and are offered primarily by Azizi Bank and Islamic Bank of Afghanistan. The overall picture that emerges from the table is that the level of adoption of digital banking has increased in all Afghan banks, but the degree to which they are technologically advanced and service diversified is very different. These disparities could have implications on customer engagement and the overall progress of digital financial inclusion in Afghanistan.

5.3 Sample Characteristics

Variable	Category	N	% of sample
Gender	Male	304	75.8 %
	Female	97	24.2 %
Age	18–25 yrs.	79	19.7 %
	26–40 yrs.	285	71.1 %
	41–60 yrs.	37	9.2 %
Residence	Urban	214	53.4 %
	Rural	187	46.6 %
Education	High School	42	10.5 %
	Bachelor	248	61.8 %
	Master	79	19.7 %
	PhD	8	2.0 %
	No Education	24	6.0 %

Source: Compiled by the researchers based on survey data collected from customers of selected Afghan banks (2025).

Table 3 shows the demographic data of respondents used in the study. The results indicate that most of the respondents are males (75.8%) and females (24.2%). This represents that the males were the majority of customers engaged in digital banking activities in the banks surveyed. As far as age distribution is concerned, the largest group of respondents (71.1%) was from 26 to 40 years, followed by respondents aged 18 to 25 years (19.7%), and respondents aged 41 to 60 years (9.2%). The findings indicate that the digital banking services are more widely utilized among the younger and middle aged people, who are more accustomed with digital technology. As for the place of residence, 53.4% of the respondents lived in urban areas while 46.6% lived in rural areas. The relative balance of this distribution is an indication of the engagement with digital banking across both urban and rural customers, while urban customers slightly dominated the sample. The educational background of the respondents suggests that most of them (61.8%) possessed a bachelor's degree, and 19.7% a master's degree. Respondents who only had a high school education accounted for 10.5%, 6.0% of the respondents had no education at all, and 2.0% of the respondents held a PhD degree. Overall, the results show that most participants were relatively well educated, which is likely to have a positive impact on awareness, acceptance, and use of digital banking services.

5.4 Digital Service Usage

Service	N	% of sample
Online & Mobile Banking	134	33.4 %
Mobile Banking	109	27.2 %
ATM Services	95	23.7 %
None	42	10.5 %
Online Banking	21	5.2 %

Source: based on survey responses collected from customers of selected Afghan banks (2025).

The distribution of respondents by type of banking services used is presented in table 4. The results show that mobile and online banking is the most frequented service (33.4%) and mobile banking alone was the second most frequented service (27.2%). This indicates that a significant number of customers use digital means for doing banking transactions. Traditional electronic banking is still an important service with 23.7% of respondents using ATM services. Conversely, there was low stand-alone usage of online banking platforms as 5.2% of respondents reported using online banking only. Interestingly, 10.5% of respondents said they never used any banking services on a regular basis, indicating a group of people who aren't very active with formal or digital banking. Overall, the findings indicate that digital banking is expanding in Afghanistan, but the adoption of digital banking is not consistent across customers, with mobile being the dominant channel of customer interaction.

5.5 Reliability and Factor Analysis

The internal consistency of the nine digital banking perception items is excellent with a Cronbach's alpha of 0.95. Item-total correlations ranged from 0.77 to 0.88 and omitting any item did not increase the alpha. The sampling adequacy of KMO was 0.91, and Bartlett's test was significant ($\chi^2(8) = 16.99$, $p < 0.05$), indicating that the data was suitable for factor analysis. The exploratory factor analysis (principal axis factoring with varimax rotation) revealed one factor which explained 66 % of the variance (factor loadings 0.72–0.87). While the RMSEA was relatively high (0.204), other fit indices (RMSR = 0.06; TLI = 0.81) validated the one factor solution and a Digital Banking Engagement Index was used in subsequent analyses.

Table 5: Reliability and Factor Analysis Results for Digital Banking Scale

Test / Measure	Result	Interpretation
Cronbach's Alpha	0.95	Excellent internal consistency
Item–Total Correlation	0.77 – 0.88	Strong item reliability
Alpha if Item Deleted	No improvement	All items retained
KMO Measure	0.91	Sampling adequacy (excellent)
Bartlett's Test	$\chi^2(8) = 16.99$, $p < 0.05$	Factor analysis appropriate
Extraction Method	Principal Axis Factoring	—
Rotation Method	Varimax	—
Number of Factors	1	Unidimensional structure
Variance Explained	66%	Strong explanatory power
Factor Loadings	0.72 – 0.87	Strong item contributions
RMSEA	0.204	Poor fit indication
RMSR	0.06	Good fit
TLI	0.81	Acceptable fit
Final Output	Digital Banking Engagement Index	Used for further analysis

Source: based on reliability and exploratory factor analysis results of the Digital Banking Engagement scale (2025).

5.6 Descriptive Statistics

The descriptive analysis gives an overview of the respondents' perception of digital banking services, on a scale ranging from 1 (strongly disagree) to 5 (strongly agree) on the key dimensions measured. The results show that the average scores of perception items of digital banking were between 3.70 and 4.06, which shows good average perception of digital banking services among the respondents in Afghanistan. The mean score for the individual constructs were higher for comfort (M = 4.06, SD = 1.06), suggesting that users are generally comfortable using digital banking platforms. Convenience (M = 4.00, SD = 1.05) and future use intention (M = 4.01, SD = 1.12) are followed by high acceptance and future intent to use digital banking services. In the same way, the mean for recommendation behavior was also high (M = 4.01, SD = 1.09) which indicates positive word of mouth potential of users. The efficiency related factors are measured by speed (M = 3.97, SD = 1.12) and cost reduction (M = 3.90, SD = 1.04) which points to the operational and financial advantages of digital banking over traditional banking approaches. But some dimensions show relatively low scores. The mean score for trust was 3.82 (SD = 1.12), indicating a moderate level of trust but that security and data privacy issues continue to exist within customer perceptions. Similarly, Internet access (M = 3.71, SD = 1.22) and digital skills (M = 3.70, SD = 1.17) had the lowest scores of all constructs, indicating structural and capability barriers that restrict use of digital banking services. The other items relating to the engagement were also similar, with mean values between 3.67 and 4.01, suggesting a high level of customer engagement with digital banking services. However, the findings are clear, that attitudes towards digital banking are positive in Afghanistan, but there is a need for further enhancement of digital literacy, infrastructure access, and trust-building measures to foster more meaningful and lasting interactions.

Table 6: Descriptive Statistics of Digital Banking Perception and Engagement Items (5-point Likert Scale)

Item	Mean	Std. Deviation	Interpretation
Comfort	4.06	1.06	Positive
Convenience	4.00	1.05	Positive
Trust	3.82	1.12	Moderately positive
Speed	3.97	1.12	Positive
Cost Reduction	3.90	1.04	Positive
Internet Access	3.71	1.22	Moderately positive
Digital Skills	3.70	1.17	Moderately positive
Future Use Intention	4.01	1.12	Positive
Recommendation	4.01	1.09	Positive
Engagement Items (Overall)	3.67 – 4.01	—	Moderately to positively inclined

Source: based on descriptive statistical analysis of respondents' perceptions and engagement with digital banking services (2025).

5.7 Group Comparisons

Independent samples t-tests and one-way ANOVA were used to evaluate differences in engagement by demographic group. There was a significantly higher engagement level reported by men compared to women ($t = 4.84$, $p < 0.001$). Engagement peaked in the 26–40 years group (mean ≈ 4.03), significantly higher than the 41–60 years group ($F(2, 398) = 6.89$, $p = 0.001$). There was greater engagement among urban residents than among rural residents ($t = 6.45$, $p < 0.001$). The engagement was strongly influenced by education, with those who had no education rating at the lowest level (mean ≈ 3.10) and those who had Master's degrees rating at the highest level (mean ≈ 4.10) ($F(4, 396) = 7.45$, $p < 0.001$). These patterns highlight digital literacy and digital infrastructure inequities.

Table 7: Differences in Digital Banking Engagement Across Demographic Groups

Variable	Test Used	Statistic	p-value	Key Finding
Gender	Independent t-test	t = 4.84	p < 0.001	Men show significantly higher engagement than women
Age Groups	One-way ANOVA	F(2, 398) = 6.89	p = 0.001	Highest engagement in 26–40 years group
Urban vs Rural	Independent t-test	t = 6.45	p < 0.001	Urban residents have higher engagement than rural
Education Level	One-way ANOVA	F(4, 396) = 7.45	p < 0.001	Engagement increases with education level

Source: Based on survey results

5.8 Regression Analysis

This section builds on the descriptive findings and uses a multiple linear regression model to determine which factors are most important for understanding digital banking engagement among the demographic variables. The model considers the impact of gender, age, education level and place of residence on the same time, so that the relative predictive power of these variables can be assessed. The regression model is found to be statistically significant as shown by the F-value of 3.75 and the p-value of 0.0003, which are sufficiently small to rule out random error. But the explanatory power of the model is rather limited and only 0.07. This suggests that the combination of the demographic variables accounted for about 7% of the variability of digital banking engagement. This degree of explanation is quite low, but not unusual in social science research, and implies that other factors besides demographic factors also play a role (behavioural, technological and economic determinants). According to the analysis, place of residence and education level are the two predictors that are statistically significant for digital banking engagement.

A. **Education Level (No Formal Education):** Not attending school is the most important factor in the model. People who do not have a formal education show a substantial decline with digital banking services engagement (ß = -0.71, p < 0.001). The limited education observed may be a structural barrier to using digital financial platforms effectively. It suggests that the current digital banking systems could have a certain degree of literacy and digital competency requirement, which further emphasizes the importance of the inclusion of the simpler interface, visual guidance, and voice assistance in the design.
B. **Place of Residence (Urban vs Rural):** It is found that digital banking engagement (β = 0.27, p < 0.01) is positively related to being located in urban areas. This is probably due to the differences between urban and rural areas in terms of digital infrastructure, such as Internet access, Internet service availability, and the development of the financial ecosystem, which is more advanced in urban areas. There is also a positive, though slight, correlation between age and engagement (β = 0.23 p ≈ 0.07) especially for those aged between 26-40. While this group seems to be more active with regard to using digital banking, it is not statistically significant at the conventional level. This indicates that the age difference effect is smaller after education and geographical location are taken into account. Once other factors are taken into account, gender is not a statistically significant predictor of digital banking engagement. This suggests that the gap in engagement between men and women is very little after adjusting for differences in education and place of residence. Likewise, there was no statistically significant difference in engagement rates between those with higher education qualifications than basic literacy (Bachelor's, Master's, PhD). This indicates a threshold effect: after reaching a certain point in education, further education does not seem to significantly impact on the behavior of digital banking usage.

Table 8: Multiple Linear Regression Analysis of Factors Influencing Digital Banking Engagement

Predictor Variable	Coefficient (β)	p-value	Interpretation
Gender	—	n.s.	Not a significant predictor
Age (26–40 years)	0.23	p ≈ 0.07	Marginally significant positive effect
Education (No education)	–0.71	p < 0.001	Strong negative effect on engagement
Education (Bachelor's, Master's, PhD)	—	n.s.	Not significant after controls
Urban Residence	0.27	p < 0.01	Significant positive effect on engagement

Source: Based on survey results

6. QUALITATIVE FINDINGS

Table 9: Interview Themes on Digital Banking in Afghanistan

Theme	Key Findings	Interpretation
Current Service Adequacy	Most managers consider current digital banking services adequate, though public banks lag behind private banks	Service quality differs across ownership structure
Service Usage Patterns	Strong uptake in urban areas; moderate to low usage in rural regions	Clear urban–rural digital divide
Core Digital Channels	SMS banking and ATM cards are most commonly used services	Basic digital services dominate usage
Advanced Digital Services	Internet banking, mobile wallets, POS, and QR payments concentrated in few private banks	Advanced services are limited and unevenly adopted
Digital Transformation Initiatives	Upgrading platforms, APS integration, chatbots, e-KYC, digital onboarding, marketing, and fee reductions	Banks are actively improving digital ecosystems
Trust and Security	Use of encryption, 2FA, firewalls, IDS, audits, cybersecurity training, and transparent communication	Security is a major priority for engagement
Infrastructure Needs	Need for better network reliability, server capacity, core banking systems, and regulatory clarity	Infrastructure gaps remain a key constraint
Innovation Strategies	USSD/offline apps, multilingual systems, biometrics, QR payments, virtual cards, AI chatbots, fraud detection, API banking	Banks are exploring inclusive digital innovations
Key Barriers	Low digital literacy, limited internet access, system reliability issues	Structural barriers restrict adoption
Overall Insight	Ease of use, trust, service diversity, and infrastructure drive engagement	Aligns with quantitative findings

Source: Developed by the researchers based on insights gathered from interviews with bank managers and IT professionals from selected Afghan banks (2025).

The interviews with bank managers and IT officers were analyzed thematically, which gave valuable qualitative data of digital banking in Afghanistan. Overall, the results show that, although most managers rate the level of digital service delivery as being satisfactory, there are substantial differences between public and private banks, with the former being slightly less advanced in terms of service quality and innovation as compared to the latter. The results also show an obvious rural–urban gap in the use of digital banking. The use of digital services is high in urban areas and moderate in the rural areas. Meanwhile, SMS banking and ATM cards are still the most common digital channels, primarily due to their convenience and availability. More sophisticated services like mobile wallet, POS terminals, QR code payments, and internet banking, on the other hand, are found in a small number of private banks and tend to be adopted by few customers in general. There are several efforts underway to enhance digital interactions at banks. Banks are actively trying to do more to enhance digital interactions through a variety of efforts. These involve improving internet and mobile banking systems, integration with the

Afghanistan Payments System (APS), the adoption of chatbots, extending 24/7 customer service and e-KYC and digital onboarding systems. Digital services are also being pitched with marketing campaigns and fee reductions to bring more customers into their fold. Trust and security were identified as key issues discussed in the interviews. Banks are working on encryption technologies, two factor authentication (2FA), firewalls, intrusion detection systems and frequent security audits. They also have been offering cyber security training to employees and customers and are communicating transparently and offering prompt customer support to help users feel confident about digital systems. The participants also highlighted the need to tackle basic infrastructure issues. These encompass the enhancement of network reliability, expansion of server capacity, fortification of the core banking systems as well as the creation of a more explicit regulatory regime for e-banking services. If these improvements are not made, digital growth will continue to be stunted. Innovative solutions like USSD and offline applications on feature phones, multi-lingual and user-friendly mobile applications, biometric authentication, QR code payments, virtual cards, AI-powered chatbots, real-time fraud detection, and API-based banking integration were among those suggestions. In general, these qualitative findings corroborate the quantitative findings of the study. They state that ease of use, ease of trust, service diversity and infrastructure are critical factors for digital banking engagement and low digital literacy, limited internet access, system reliability issues are the major barriers. The results also indicated that technological investments, without digital literacy and infrastructure improvements, will not have a meaningful impact on adoption.

7. DISCUSSION

7.1 Adopting a thinking approach that separates perception from proficiency.

This study's key finding is the identification of a large capability gap in the digital banking ecosystem in Afghanistan. The results of the scales descriptive analysis showed that the digital banking scale has high internal reliability (Cronbach's $\alpha = 0.95$) with a high unidimensional structure to explain the total variance of 66%. However, there was a significant difference between the positive perception of the user and actual digital competency revealed in the descriptive analysis of the scales. The mean scores were relatively high for comfort with digital banking (4.06 ± 1.06) and intention for future use (4.01 ± 1.12), suggesting that the digital banking platforms are generally easy and useful to use. Regardless of these positive perceptions, the lowest mean score was for digital skills (3.70 ± 1.17), indicating that many users do not have the technical skills needed for digital banking to be effective and sustainable. This discovery suggests that banks might have lowered the barriers to perceived ease of use but there are still some difficulties in digital self-efficacy and operational skill. This interpretation is further supported by the regression analysis which shows that the absence of formal education was the strongest negative predictor of digital banking engagement ($\beta = -0.71$, $p < 0.001$). This finding indicates a skewed distribution of the advantages of the current digital banking landscape: those with high levels of education, especially those living in urban areas, benefit the most, while those less literate and less educated are at greater risk of being less able to use digital financial services. Hence, the study emphasizes the need to embed digital literacy programmes in financial inclusion policies.

7.2 The Role of Infrastructure in Building Trust

Trusting in infrastructure is a key component of the trust equation. Infrastructure is one of the elements of the trust equation. This study's findings also show that there is a close correlation between trust in digital banking and the reliability of the technological infrastructure. Trust is frequently described in the literature as a psychological or relational component, but the Afghan case shows that in practice digital systems are used to generate trust. This moderate trust score (3.82 ± 1.12) is close to the trust scores of their access to the internet and the quality of internet (3.71 ± 1.22). The interviews with IT managers and branch administrators also reveal that poor internet connection, frequent system downtime

and networks downtime affect the customer trust in digital banking tools. Technical disruptions are often viewed not just as an operational inconvenience, but as a sign of financial insecurity and transaction risk. The regression results also corroborate this interpretation as urbanized residence significantly predicts increased levels of digital banking engagement ($\beta = 0.27$, $p < 0.01$). This is a correlation with differences in the development of infrastructure between urban and rural areas. As for electricity supply, internet and telecommunications services, generally, urban areas are better served with stable supply, wider availability and more robust infrastructure; rural areas are still struggling with inconsistencies in services and poor internet coverage. In consequence, many rural customers continue to use elementary and rudimentary banking services, like SMS banking and ATM services, as opposed to fully-fledged mobile or net banking services.

8. IMPLICATIONS

8.1 Managerial Implications

The results indicate that banking institutions need to adopt a more innovative approach to promotions and focus on educating their clients and improving their accessibility. As limited digital competency is a key obstacle to engagement, banks should invest more in enhancing their users' digital skills. First, banks should make the investment in structured digital learning programs for first time users with practical advice and training. It could be branch-based staff or "digital ambassadors" helping customers on how to use digital banking applications and services safely and effectively. Secondly, banks will need to create technological solutions that will address infrastructure constraints, especially in rural areas. Offline capable applications, low-connectivity mobile interfaces and USSD based services can help enhance accessibility for users in low connectivity environments. This would allow banks to offer increasing digital services, without needing to maintain constant access to the internet. Third, designing interfaces that are inclusive for people with a lower level of literacy is a crucial aspect of usability. The use of multilingual platforms, especially Pashtun, Dari, and the use of icons for navigating and making transactions easy, may help overcome many of the difficulties that were identified in the regression analysis linked to educational restrictions.

8.2 Policy Implications

The findings also have significant implications for policymakers and financial regulators. Regulatory bodies need to be more active in fostering an equitable access to digital financial services to minimize the digital divide effect. A key aspect of this would be the introduction of minimum digital service standards for all licensed financial institutions. These standards would help ensure that key digital banking capabilities are accessible, secure, and on-demand in both the public and private financial systems. Policymakers should also promote the development of underserved infrastructure in low-density areas as part of financial incentives and regulation. Greater access to ATMs, POS machines and agency banking in rural areas could make financial services more available, and help reinforce digital banking in rural areas. Last but not least, bolstering cybersecurity governance will be essential to boost the confidence in digital banking systems. International best practice information security standards like ISO 27001 should be encouraged and/or mandated by regulatory frameworks and security measures should be strengthened such as two factor authentication and secure transaction protocols.

9. CONCLUSION

The digital banking landscape in Afghanistan has just entered an important period of transition and growth. Afghans' digital banking ecosystem is in a pivotal stage of change and development. The participation rate is strong, but there are significant structural barriers to increased and more extensive participation, particularly among older and rural groups. This study underscores the need for more than technology to deliver sustainable financial inclusion. There is a need to leverage a combination of user-centered technological design, a reliable digital infrastructure and

sufficient digital literacy to drive meaningful digital banking engagement. Limited education, geographic inequality, are still among the most important challenges to adoption and sustained use. Therefore, it is a need to involve all stakeholders, including banks, regulators and infrastructure, to enhance digital banking engagement in Afghanistan. A more comprehensive approach to digital literacy initiatives, enhancing connectivity in underserved areas, and creating a more inclusive banking system can help build a more level playing field for digital financial services. Digital banking could be a service used by the urban population only but can become a more comprehensive tool for financial inclusion and economic participation and long-term economic resilience for the broader Afghanistan population, if these structural and educational challenges are adequately addressed.

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